IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is identified in the ensuing listing of the claims. This listing of the claims replaces all previously submitted claims listings.

1. (Currently amended) A semiconductor device component, comprising:

a substrate having ~~an active~~ a surface with contact pads exposed thereto, ~~said contact pads being configured to be connected with conductors on a first surface of another semiconductor device, each contact pad of said substrate being substantially in line with at least one other contact pad and positioned proximate to a center line of said substrate~~; and

at least one stabilizer protruding from said ~~active~~ surface and positioned between a periphery of said ~~active~~ surface and each contact pad exposed to said ~~active~~ surface and including a plurality of at least partially superimposed, contiguous, mutually adhered layers of dielectric material.

2. (Currently amended) The semiconductor device component of claim 1, wherein said at least one stabilizer protrudes from said ~~active~~ surface a distance no more than a distance that at least one conductive structure to be disposed in contact with at least one of said contact pads will extend beyond said ~~active~~ surface.

3. (Currently amended) The semiconductor device component of claim 2, wherein said at least one stabilizer protrudes from said ~~active~~ surface a distance that permits conductive structures on said contact pads to contact ~~said~~ conductors of ~~said~~ another semiconductor device component upon assembly of said substrate with said another semiconductor device component such that said surface of said assembly faces a conductor-bearing surface of said another semiconductor device component.

4. (Canceled)

5. (Original) The semiconductor device component of claim 1, wherein said at least one stabilizer comprises a photocurable material.

6. (Canceled)

7. (Currently amended) The semiconductor device component of claim 1, wherein said at least one stabilizer is positioned proximate a corner of said ~~active~~ surface.

8. (Previously Presented) The semiconductor device component of claim 1, wherein said at least one stabilizer has a cross-sectional shape of one of quadrilateral, round, oval, and triangular.

9. (Currently amended) The semiconductor device component of claim 1, wherein said at least one stabilizer is elongated in a direction parallel to said ~~active~~ surface.

10. (Original) The semiconductor device component of claim 1, further comprising protruding conductive structures in contact with selected ones of said contact pads.

11. (Original) The semiconductor device component of claim 10, wherein said conductive structures comprise at least one of solder bumps, conductive columns, conductor-filled columns, and z-axis conductive adhesive.

12. (Original) The semiconductor device component of claim 1, wherein said substrate comprises a semiconductor wafer with a plurality of dice thereon.

13. (Currently amended) A semiconductor device component, comprising:

a substrate having ~~an active~~ a surface with contact pads exposed thereto, said contact pads being configured to be connected with conductors on a ~~first~~ surface of another semiconductor device component; and

at least one stabilizer protruding from said ~~active~~ surface of said substrate and positioned between a periphery of said ~~active~~ surface and said contact pads, said at least one stabilizer ~~having~~ comprising a plurality of superimposed, contiguous, mutually adhered layers, each of which comprises dielectric material.

14. (Currently amended) The semiconductor device component of claim 13, wherein said at least one stabilizer protrudes from said ~~active~~ surface of said substrate a distance no more than a distance that at least one conductive structure to be disposed in contact with at least one of said contact pads will extend beyond said ~~active~~ surface.

15. (Currently amended) The semiconductor device component of claim 14, wherein said at least one stabilizer protrudes from said ~~active~~ surface of said substrate a distance that permits conductive structures on said contact pads to contact said conductors of said another semiconductor device component.

16. (Original) The semiconductor device component of claim 13, wherein said at least one stabilizer comprises a dielectric material.

17. (Original) The semiconductor device component of claim 13, wherein said at least one stabilizer comprises a photocurable material.

18. (Currently amended) The semiconductor device component of claim 13, wherein said at least one stabilizer is positioned proximate a corner of said ~~active~~ surface of said substrate.

19. (Previously Presented) The semiconductor device component of claim 13, wherein said at least one stabilizer has a cross-sectional shape of one of quadrilateral, round, oval, and triangular.

20. (Currently amended) The semiconductor device component of claim 13, wherein said at least one stabilizer is elongated in a direction parallel to said ~~active~~ surface.

21. (Original) The semiconductor device component of claim 13, further comprising protruding conductive structures in contact with selected ones of said contact pads.

22. (Original) The semiconductor device component of claim 21, wherein said conductive structures comprise at least one of solder bumps, conductive columns, conductor-filled columns, and z-axis conductive adhesive.

23. (Original) The semiconductor device component of claim 13, wherein said substrate comprises a semiconductor wafer with a plurality of dice thereon.

24. (Currently amended) The semiconductor device component of claim 13, wherein said at least one stabilizer maintains a substantially uniform distance between said ~~active~~ surface of said substrate and said ~~first~~ surface of said another semiconductor device component.

25. (Currently amended) A semiconductor device component, comprising:

a substrate having ~~an active~~ a surface with contact pads exposed thereto, said contact pads being configured to be connected with conductors on a first surface of another semiconductor device component, each contact pad of the semiconductor device component being arranged substantially in-line with a plurality of other contact pads and positioned proximate to a center line of said substrate; and

at least one nonconductive stabilizer protruding from said ~~active~~ surface of said substrate and positioned between a periphery of said ~~active~~ surface and said contact pads, said at least one stabilizer ~~configured to allow an insulative underfill material to flow into a space created when said substrate is connected with said another semiconductor device~~ comprising an elongate element which extends in a direction parallel to said surface of said substrate.

26. (Currently amended) The semiconductor device component of claim 25, wherein said at least one stabilizer is configured so that voids do not occur in ~~said~~ an insulative underfill material when said insulative underfill material is flowed into ~~said~~ a space created when said substrate is connected with said another semiconductor device component.

27. (Currently amended) The semiconductor device component of claim 25, wherein said at least one stabilizer protrudes from said ~~active~~ surface of said substrate a distance no more than a distance that at least one conductive structure to be disposed in contact with at least one of said contact pads will extend beyond said ~~active~~ surface.

28. (Currently amended) The semiconductor device component of claim 27, wherein said at least one stabilizer protrudes from said ~~active~~ surface a distance that permits conductive structures on said contact pads to contact said conductors of said another semiconductor device component.

29. (Original) The semiconductor device component of claim 25, wherein said at least one stabilizer comprises a dielectric material.

30. (Original) The semiconductor device component of claim 25, wherein said at least one stabilizer comprises a photocurable material.

31. (Currently amended) A semiconductor device component, comprising:

a substrate having ~~an active~~ a surface with contact pads exposed thereto~~, said contact pads being configured to be connected with conductors on a first surface of another semiconductor device, each contact pad of the semiconductor device component being arranged substantially in line with a plurality of other contact pads and positioned proximate to a center line of said substrate~~; and

at least one stabilizer protruding from said ~~active~~ surface, comprising an elongate structure which extends in a direction parallel to a plane of said surface, and being positioned between a periphery of said ~~active~~ surface and said contact pads~~, said at least one stabilizer fabricated directly on said active surface of said substrate~~.

32. (Canceled)

REMARKS

The Final Office Action dated July 16, 2003, has been received and reviewed.

Claims 1-32 are currently pending and under consideration in the above-referenced application. Each of claims 1-32 stands rejected.

It is proposed that claims 4, 6, and 32 be canceled without prejudice or disclaimer. Several amendments to the claims are also proposed.

Reconsideration of the above-referenced application is respectfully requested.

Drawings

The proposed drawing correction filed on April 14, 2003, was approved by the Examiner. Formal drawings as previously corrected are submitted herewith.

Rejections Under 35 U.S.C. § 102(b)

Claims 1, 3-5, 7-11, 31, and 32 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated the subject matter described in Japanese patent publication no. 58-157146 of Watanabe (hereinafter "Watanabe").

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

FIGs. 1 and 2 of Watanabe illustrate a semiconductor device component that includes a substrate 1 with a plurality of contact pads 2 thereon. Five of the illustrated contact pads 2 are substantially in-line with one another and are positioned proximate to a center line of the substrate. In addition, the semiconductor device shown in FIGs. 1 and 2 of Watanabe includes spacers 6, which may be formed from a photoimageable material (*see* Abstract), at corners of the substrate 1, between the contact pads 2 and an outer periphery of the substrate 1.

Independent claim 1, as proposed to be amended herein, recites a semiconductor device component which includes a substrate and at least one stabilizer protruding from the substrate.

The at least one stabilizer of amended independent claim 1 comprises a plurality of at least partially superimposed, contiguous, mutually adhered layers of dielectric material.

While Watanabe discloses that the spacers 6 of the semiconductor device component described therein may be formed from a photosensitive resin (*see* Abstract), which is presumed to be a dielectric material, Watanabe also describes that the spacers 6 are formed by conventional photolithography techniques (*see* Abstract), indicating that none of the spacers 6 includes any more than a single layer of material.

As Watanabe does not expressly or inherently describe that any of the spacers thereof includes a plurality of at least partially superimposed, contiguous, mutually adhered layers of dielectric material, it is respectfully submitted that Watanabe does not anticipate each and every element of amended independent claim 1, as is required to maintain a rejection under 35 U.S.C. § 102(b).

It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), amended independent claim 1 is allowable over Watanabe.

Each of claims 3, 5, and 7-11 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Moreover, the rejection of claim 3 under 35 U.S.C. § 102(b) is not understood, as claim 3 depends from claim 2, which the Office has acknowledged recites elements that are not expressly or inherently described or anticipated by Watanabe.

Claim 9 is additionally allowable since Watanabe does not expressly or inherently describe that any of the spacers 6 thereof "is elongated in a direction parallel to [a] surface" of the substrate upon which it is positioned. Rather, as is clearly shown in FIG. 1 of Watanabe, each of the spacers 6 is elongated in a direction which is *perpendicular* to a surface of the substrate 1.

In view of the proposal to cancel claim 4 without prejudice or disclaimer, the rejection thereof is rendered moot.

Independent claim 31, as proposed to be amended herein, recites a semiconductor device component that includes a substrate that includes a surface with contact pads exposed thereto and

at least one stabilizer protruding from the surface of the substrate. The at least one stabilizer comprises an elongate structure which extends in a direction parallel to a plane of the surface of the substrate.

Again, Watanabe lacks any express or inherent description that any of the spacers 6 of the semiconductor device component described therein extends in a direction which is parallel to a plane of the surface of the substrate 1. Instead, the description of Watanabe is limited to spacers 6 which extend in a direction that is *perpendicular* to a surface of the substrate 1, as shown in FIG. 1 thereof.

Accordingly, it is respectfully submitted that Watanabe does not anticipate each and every element of amended independent claim 31 and that, under 35 U.S.C. § 102(b), amended independent claim 31 recites subject matter which is allowable over that described in Watanabe.

In the event that independent claim 32 is canceled without prejudice or disclaimer, the rejection thereof will be rendered moot.

For these reasons, withdrawal of the 35 U.S.C. § 102(b) rejections of claims 1, 3-5, 7-11, 31, and 32 is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Each of claims 2, 6, and 13-30 has been rejected under 35 U.S.C. § 103(a).

M.P.E.P. § 706.02(j) sets forth the standard for a rejection under 35 U.S.C. § 103(a):

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Watanabe in View of Kuniaki

Claims 2 and 25-30 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is asserted to be unpatentable over that taught in Watanabe, in view of the teachings of Japanese patent publication no. 10-189653 of Kuniaki et al. (hereinafter "Kuniaki").

The relevant teachings of Kuniaki have been summarized above.

Kuniaki teaches a semiconductor element 3 that that can be easily subjected to flip-chip mounting to a circuit board and is suitable for high-density mounting, using one or several spacing solder bumps 12, which are formed from the same materials and have the same shapes as solder bumps 11 by which electrical connections with terminals of the circuit board are made. The spacing solder bumps 12, which are secured to the semiconductor element 3 by way of dummy bond pads 5, are positioned adjacent to corners of the semiconductor element 3.

Claim 2 is allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Independent claim 25, as proposed to be amended herein, recites a semiconductor device component that includes a substrate and at least one nonconductive stabilizer. The at least one nonconductive stabilizer of amended independent claim 25 is an elongate element which extends in a direction parallel to a surface of said substrate.

It is respectfully submitted that there are at least two reasons that the asserted combination of teachings from Watanabe and Kuniaki does not support a *prima facie* case of obviousness against independent claim 25.

First, it is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the teachings of Watanabe and Kuniaki in the manner that has been asserted. In particular, the spacers 6 of Watanabe are formed from a photoimageable polymer, which is presumed to be a dielectric material, whereas the spacing solder bumps 12 of Kuniaki are formed from solder, which is a conductive material. Further, the spacers 6 of Watanabe may be formed directly on a surface of a substrate 1, whereas dummy bond pads 5 are required to secure the spacing solder balls 12 of Kuniaki to the semiconductor element 3 taught therein.

In view of the divergence in the teachings of Watanabe and Kuniaki, it appears that any motivation to combine teachings from these references could only have been improperly gleaned from the hindsight provided by the subject matter disclosed in the above-referenced application.

Second, it is respectfully submitted that neither Watanabe nor Kuniaki, taken either together or separately, teaches or suggests each and every element of amended independent claim 25. Specifically, neither Watanabe nor Kuniaki teaches or suggests a stabilizer which is an elongate element that extends in a direction parallel to a surface of a substrate. Rather, the spacers 6 of Watanabe and the spacing solder balls 12 of Kuniaki extend in directions which are *perpendicular* to surfaces of their corresponding substrates.

It is, therefore, respectfully submitted that the asserted combination of teachings from Watanabe and Kuniaki does not support a *prima facie* case of obviousness against amended independent claim 25. Accordingly, under 35 U.S.C. § 103(a), amended independent claim 25 is allowable over the teachings of both Watanabe and Kuniaki, taken either together or separately.

Each of claims 26-28 and 30 is allowable, among other reasons, for depending either directly or indirectly from claim 25, which is allowable.

Watanabe in View of Farnworth and Sato

Claims 6, 13-19, and 21-24 stand rejected under 35 U.S.C. § 103(a) for purportedly reciting subject matter which is unpatentable over teachings from Watanabe, in view of the teachings of U.S. Patent 5,484,314 to Farnworth (hereinafter "Farnworth") and U.S. Patent 6,287,895 to Sato (hereinafter "Sato").

The relevant teachings of Watanabe are summarized above.

Farnworth teaches high aspect ratio support structures that function as spacers 18 in evacuated, flat-panel displays and the like. Stereographic printing apparatus 30 of types readily available in the art may be used to form the spacers 18. An electrode plate 21 is placed in a vat 34 with light-sensitive resin 18 on the top portion of a pedestal 32 with an adjustable height. Col. 3, lines 49-64. The light-sensitive resin 18 forms a very thin layer over the electrode plate 21. The depth of the layer is determined by the strength of a laser beam 33 emitted from a laser 31 of the stereographic printing apparatus 30, and represents the height of

the spacer 18. The laser 31 is programmed to direct the laser beam 33 toward the display electrode 21 in a pattern representing the locations of the spacers 18. As the laser beam 33 impinges the resin material 18 , it hardens or cures. These processes are repeated to form spacers 18 that include multiple superimposed layers.

After the spacers 18 have been completed, the electrode plate 21 and an anode plate 16 are attached and sealed, and a vacuum is created in the space between them, with the spacer structures 18 preventing implosion of the electrode plates upon each other. Col. 4, lines 15-51. The resulting evacuated display structures may, for example, comprise so-called "flat panel displays," such as field emission displays, liquid crystal displays, plasma displays, electro-luminescent displays, vacuum fluorescent displays, flat CRT displays, and the like. Col. 4, lines 61-67.

Sato is apparently relied upon for its teaching that a substrate may include a semiconductor device with a plurality of dice thereon, as recited in claims 12 and 23 of the above-referenced application.

It is proposed that claim 6 be canceled without prejudice or disclaimer, rendering the rejection thereof moot.

Independent claim 13, as proposed to be amended herein, recites a semiconductor device component which includes a substrate and at least one stabilizer protruding from a surface of the substrate. The at least one stabilizer of amended independent claim 13 comprises a plurality of superimposed, contiguous, mutually adhered layers, each of which comprises dielectric material.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against independent claim 13 because one of ordinary skill in the art would not have been motivated to combine the teachings of Farnworth with those of either Watanabe or Sato. In particular, like independent claim 13, Watanabe and Sato are both drawn to semiconductor device components which include contact pads that are configured to be connected, in flip-chip orientation, to conductors of other semiconductor device components. In contrast, Farnworth lacks any teaching or suggestion that the electrode plate 21 thereof, from which columnar spacers 18 protrude, includes contact pads that are configured to be connected with conductors on a surface of another semiconductor device component. Rather, the teachings of Farnworth

are limited to use of the columnar spacers 18 to separate an electrode plate 21, such as a field emission array, of a flat panel display apart from an anode plate 16, or screen, of the flat panel display. The spacers 18 of Farnworth are also configured to prevent the anode plate from collapsing as air and gases are evacuated (*i.e.*, a vacuum is formed) between the electrode plate 21 and the anode plate 16.

In view of these differences between the teachings of Watanabe and Sato and those of Farnworth, it is respectfully submitted that any motivation to combine the teachings of these references in the manner that has been asserted could only have been improperly gleaned from the hindsight provided by the disclosure of the above-referenced application.

Accordingly, it is respectfully submitted that a *prima facie* case of obviousness has not been established against independent claim 13. It is, therefore, respectfully submitted that, under 35 U.S.C. § 103(a), the subject matter recited in independent claim 13 is allowable over that taught in Watanabe, Farnworth, and Sato, taken either in combination or individually.

Claims 14-19 and 21-24 are each allowable, among other reasons, for depending either directly or indirectly from claim 13, which is allowable.

Watanabe in View of Blanton

Claim 20 stands rejected under 35 U.S.C. § 103(a) for assertedly reciting subject matter that is not patentable over the teachings of Watanabe, in view of teachings from U.S. Patent 5,220,200 to Blanton (hereinafter "Blanton").

Claim 20 is allowable, among other reasons, for depending from claim 13, which is allowable.

Moreover, it is respectfully submitted that neither Watnanabe nor Blanton, taken either together or separately, teaches or suggests each and every element of claim 20.

The relevant teachings of Watanabe have been set forth above.

Blanton describes carrier substrates 30, in the form of ceramic circuit boards, that have pillars 50 formed thereon. Each pillar 50 includes a plurality of layers 40a, 40b, 40c, etc., each of which is also referred to as a "layer 40" for the sake of simplicity. Layers 40 are formed from different materials. *See, e.g.*, col. 6, line 53, to col. 7, line 35. Some of layers 40 are formed

from electrically conductive materials, while other layers 40 are formed from dielectric materials. *See id.* Pillars 50 are formed on a substrate 30 at the same time and from the same materials as circuitry is formed on the substrate 30. Col. 4, lines 55-58; col. 8, lines 9-24.

Watanabe and Blanton both lack any teaching or suggestion of a semiconductor device component which includes at least one stabilizer that includes a plurality of superimposed, contiguous, mutually adhered layers, each of which comprises dielectric material, as required by independent claim 13, from which claim 20 depends.

Further, claim 20 is further allowable since neither Watanabe nor Blanton teaches or suggests a semiconductor device component which includes at least one stabilizer which is "elongated in a direction parallel to [a] surface" of a substrate thereof. Rather, all of the spacers 6 of Watanabe extend in a direction which is *perpendicular* to a surface of the substrate 1 and all of the pillars 50 of Blanton have extend in a direction which is *perpendicular* to a surface of a substrate 30 from which they protrude.

It is, therefore respectfully submitted that, under 35 U.S.C. § 103(a), claim 20 recites subject matter which is allowable over the teachings of Watanabe and Blanton.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 2, 6, and 13-30 be withdrawn.

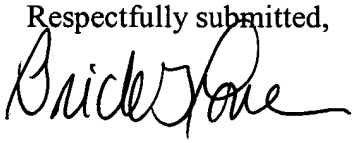
ENTRY OF AMENDMENTS

Entry of the claim amendments that are proposed herein is respectfully requested. None of the proposed claim amendments introduces new matter into the above-referenced application. Further, all of the subject matter that is recited in the claims, as proposed to be amended, has already been searched and examined. Further, it is respectfully submitted that the proposed amendments to the claims narrow the issues that remain for purposes of an appeal of the final rejection in the above-referenced application. In the event that a determination is made that the proposed amendments do not place the above-referenced application in condition for allowance, entry thereof upon filing of a Notice of Appeal in the above-referenced application is respectfully requested.

CONCLUSION

It is respectfully submitted that each of claims 1-3, 5, and 7-31 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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